

## **Elizabeth A. Krupinski, Ph.D.**

**Department of Radiology University of Arizona  
Tucson, AZ 85724**

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### **EDUCATION**

**Ph.D.** - Experimental Psychology; **Temple University**, Philadelphia, PA; Jan 1992  
**MA** - General Psychology; **Montclair State College**, Upper Montclair, NJ; Dec. 1987  
**BA** - Psychology (Neurobiology & Behavior); **Cornell University**, Ithaca, NY; June 1984  
**University Of Bath**, England; Sept. 1982 - June 1983

### **EMPLOYMENT**

**1996 - Present: Research Associate Professor** - Joint Appointment Dept Radiology, Radiology Research Division and Dept Psychology, University of Arizona  
**2002 – Present: Associate Director of Evaluation & Assessment** - Arizona Telemedicine Program  
**1995 – 2002: Assistant Director of Evaluation & Assessment** - Arizona Telemedicine Program  
**1997 - Present: Visiting Professor of Psychology** - Applied Vision Research Unit, University of Derby, UK  
**1992 - 1996: Research Assistant Professor** - Joint Appointment Dept Radiology, Radiology Research Division and Dept Psychology, University of Arizona  
**1987 - 1992: Research Specialist** - Pendergrass Image Perception Research Laboratory, Dept Radiology, University of Pennsylvania  
**1990 - 1992: Instructor** - Dept Psychology, Temple University  
**1989: Graduate Research Assistant** - Dept Psychology Infant Perception Lab, Temple University  
**1988 -1991: Graduate Research Assistant** - Dept Psychology Sensation & Perception, Temple University  
**1984: Undergraduate Research Assistant** - Dept Psychology Neurobiology & Behavior Lab, Cornell University  
**1980: Undergraduate Research Assistant** - Department of Psychology Infant Perception Lab, Cornell University

### **HONORS**

SPIE Medical Imaging Perception & Observer Performance Conference Honorable Mention Poster Award 2003  
SPIE Medical Imaging Perception & Observer Performance Conference Honorable Mention Poster Award 1999  
*Radiology* Editor's Recognition Award for reviewing with distinction 1998, 1999  
RSNA Scientific Exhibit Certificate of Merit Award; 1998  
RSNA Resident Research Award 1998 (co-author)  
Academic Radiology / Association of University Radiologists 1997 Herbert M. Stauffer Award  
RSNA Resident Research Award 1997 (co-author)  
Radiological Society of North America Scientific Exhibit Certificate Of Merit Award; 1996  
Executive Council Award of the American Roentgen Ray Society 1996 (co-author)  
Dean's Fellowship Temple University; 1991-1992  
Far West Image Perception Conference Fellowship; October 1989  
Most Outstanding Graduate Student in Arts & Sciences - Montclair State College; June 1988  
Most Outstanding Psychology Graduate Student - Montclair State College; June 1988

### **SOCIETY MEMBERSHIPS**

American Psychological Society; 1990 - present  
American Telemedicine Association; 1995 - present  
Applied Vision Association; 1991 - present  
Medical Image Perception Society; 1997 - present  
Radiological Society of North America; 1997 - present  
Sigma Xi The Scientific Research Society; 1988 - present  
SPIE - The International Society for Optical Engineering; 1993 - present

SCAR - Society for Computer Applications in Radiology; 1995 - present  
Western Psychological Association; 1992 - present  
American Association of Physicists in Medicine; 1997 – present  
Association of University Radiologists; 1997 – present  
Association for Women Faculty; 1998 – present  
American Association for Women Radiologists; 1998 - present

## **OTHER ACADEMIC ACTIVITIES**

Associate Director of Assessment & Evaluation for the Arizona Telemedicine Program: 1995 - present  
Associate Editor for Medical Physics - 1999, 2000, 2001, 2002  
Associate Editor for Radiology - 1999, 2000, 2001, 2002  
Associate Editor for Telemedicine Journal & e-Health – 2001, 2002  
Board of Directors American Telemedicine Association - 2003  
Department of Radiology Summer Physics Course for Radiology Residents (Mammography & Image Quality sections) – 1996 - present  
Director of the Radiology Resident Research Program, University of Arizona: 1996 – present  
Editor for Academic Radiology - 1997, 1998, 1999, 2000, 2001, 2002  
Editorial Board Journal of Digital Imaging – 2002, 2003  
Editorial Board Journal of Telemedicine & Telecare – 2001, 2002  
Grant Review Study Section Member:  
    US Army MRMC Breast Cancer Program - 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002 (chair)  
    US Army MRMC Ovarian Cancer Program – 2000  
    US Army MRMC Prostate Cancer Program - 2002  
    NIH NCI Diagnostic Imaging Section - 1997, 2000, 2001-2005 (Charter member Diagnostic Imaging Study Section)  
SCAR (Society for Computer Applications in Radiology) Grant Review Program - 2002  
Institutional Teaching: Psychology 230 (Measurement & Statistics); Fall 1993 – present  
    Introduction to Telemedicine (Medical School Elective); Spring 1998  
    Radiology Resident Physics Review Course; Spring 1998 - present  
    Problem-Based Learning session facilitator for 1<sup>st</sup>-Year Med Students - 1999, 2000  
Journal Reviewer: Academic Radiology; Behavior Research Methods, Instrumentation & Computers; Society for Computer Applications in Radiology; Journal of Experimental Psychology: Human Perception & Performance; Journal of Telemedicine & Telecare; IEEE Transactions on Systems, Man and Cybernetics; Radiology; Image and Vision Computing; Medical Physics; Radiology.com JRAD; Psychological Science; Telemedicine Journal & e-Health  
Medical Image Perception Society: President & founding member 1997 - present  
Member Association of Women Faculty subcommittee for Academic Professionals – 1998, 1999, 2000  
NCI/NIH Workshop Panelist - March 1998 (digital mammography)  
NHANES Dermatology Workshop Participant - June 1999  
Office for the Advancement of Telehealth (OAT)/HRSA Evaluation Advisory Committee – 2001- 2002  
Regional & National Science Fair Judge – 1996, 1997, 1998, 1999, 2000  
SPIE Medical Imaging (Image Perception & Performance) Conference Chair - 1999, 2000, 2001, 2002, 2003  
SPIE Awards Committee - 2002  
University of Arizona APEX/MESA Early Outreach Speakers Bureau - 1999, 2000, 2001, 2002  
University of Arizona College of Medicine Admissions Committee - 2000, 2001 (sub-committee chair), 2002 (sub-committee chair), 2003 (chair), 2004 (chair)  
University of Arizona Committee on Graduate Study Representative: 1995 - present  
University of Arizona Composition Board Undergraduate Writing Proficiency Exam reviewer: 1994 - present  
University of Arizona Vision Group: 1998, 1999  
WISE (Women in Science & Engineering) student sponsorship program participant: 1995, 1996, 1997, 1998, 1999, 2000, 2001  
World Congress of High-Tech Medicine International Scientific Committee Member: 2000

## **PUBLICATIONS** (\* = refereed; + = invited)

**Krupinski E, Locher P.** (1988). Skin conductance and aesthetic evaluative responses to nonrepresentational works of art varying in symmetry. Bulletin of the Psychonomic Society, 26, 355-358.

\*Kundel HL, Nodine CF, **Krupinski EA**. (1989). Searching for lung nodules: Visual dwell indicates locations of false-positive and false-negative decisions. Investigative Radiology, 24, 472-478.

Nodine CF, Locher PJ, **Krupinski EA**. (1989). The role of formal art training on the perception and aesthetic judgment of art compositions. Proceedings of the Fifth European Conference on Eye Movements, Pavia, Italy, 259-261.

\*Kundel HL, Nodine CF, **Krupinski EA**. (1990). Computer-displayed eye position as a visual aid to pulmonary nodule interpretation. Investigative Radiology, 25, 890-896.

Nodine CF, **Krupinski EA**, Kundel KL. (1990). A gaze-duration algorithm provides effective visual feedback to radiologists searching for nodules in chest x-ray images. Proceedings of the First Conference on Visualization in Biomedical Computing. IEEE Computer Society Press, 202-207.

\*Nodine CF, **Krupinski EA**, Kundel HL, Toto LC, Herman G.T. (1992). SOS - satisfaction of search or satisfaction of serendipity? Investigative Radiology, 27, 571-572.

\*Nodine CF, Kundel HL, Toto LC, **Krupinski EA**. (1992). Recording and analyzing eye-position data using a microcomputer workstation. Behavioral Research Methods, Instruments, & Computers, 24, 475-485.

\*Reed CF, **Krupinski EA**. (1992). The target in the celestial (moon) illusion. Journal of Experimental Psychology : Human Perception & Performance, 18, 247-256.

\*Weinstein RS, Bloom KJ, **Krupinski EA**, Rozek LS. (1992). Human performance studies of the video microscopy component of a dynamic telepathology system. Zentralblatt Fur Pathologie, 138, 399-401.

Alsafadi Y, **Krupinski EA**, Martinez R. (1993). The effect of lossy networks on user perception of radiological images. SPIE Medical Imaging, 1897, 408-419.

\***Krupinski EA**, Nodine C.F, Kundel HL. (1993). Perceptual enhancement of tumor targets in chest x-ray images. Perception & Psychophysics, 53, 519-526.

\***Krupinski EA**, Nodine CF, Kundel HL. (1993). A perceptually-based method for enhancing pulmonary nodule recognition. Investigative Radiology, 28, 289-294.

\*Nodine CF, Locher PJ, **Krupinski EA**. (1993). The role of formal art training on perception and aesthetic judgment of art compositions. Leonardo, 26, 219-227.

\*Hu CH, Kundel HL, Nodine CF, **Krupinski EA**, Toto LC. (1994). Searching for bone fractures: a comparison with pulmonary nodule search. Academic Radiology, 1, 25-32.

**Krupinski EA**. (1994). Perceptual enhancement of pulmonary nodule recognition in chest radiographs. SPIE Medical Imaging, 2166, 59-65.

\***Krupinski EA**, Alsafadi Y. (1994). Lossy network transmission: influence on the detection of microcalcification clusters in mammograms. Academic Radiology, 1, 333-338.

\***Krupinski EA**, Maloney K, Bessen S, Capp MP, Graham K, Hunt R, Lund P, Ovitt T, Standen JR. (1994). ROC evaluation of computer display of adult portable chest radiographs. Investigative Radiology, 29, 141-146.

Sankaran V, Barrett HH, **Krupinski E**, Derniak E. (1994). Hotelling trace criterion as a model for the performance of an IR imaging system. SPIE Infrared Technology, 2269, 551-562.

Yu YP, Martinez R, **Krupinski E**, Weinstein R. (1994). Analysis of JPEG compression on communications in a telepathology system. SPIE Medical Imaging, 2165, 283-294.

**Krupinski EA**. (1995). Requirements analysis for pediatric ICU softcopy display. SPIE Medical Imaging, 2431, 266-276.

**Krupinski EA**, Brooks WJ, Lund PJ. (1995). Demonstration of movement in the sacroiliac using ultrasound. SPIE Medical Imaging 2433, 354-360.

**Krupinski EA**, Roehrig H. (1995). Reduction of patient exposure in pediatric radiology: an observer performance study. SPIE Medical Imaging, 2436: 50 -61.

\***Krupinski EA**, Roehrig H, Yu T. (1995). Observer performance comparison of digital x-ray systems for stereotactic breast biopsy. Academic Radiology, 2,116-122.

\*Lund PJ, Heikal A, Maricic MJ, **Krupinski EA**, Williams CS. (1995). Ultrasonic imaging of the hand and wrist in rheumatoid arthritis. Skeletal Radiology, 24,591-596.

Roehrig H, **Krupinski EA**, Yu T. (1995). Physical and psychophysical evaluation of digital systems for mammography. Proc SPIE Medical Imaging,2436 : 124 - 134.

\*Roehrig H, Yu T, **Krupinski E**. (1995). Image quality control for digital mammographic systems : initial experience and outlook. J of Digital Imaging, 8 : 52-66.

\*Alexander DGA, Unger EC, Seeger SJ, Karmann S, **Krupinski EA**. (1996). Estimation of volumes of distribution and intratumoral ethanol concentrations by CT in patients undergoing percutaneous ethanol injection. Academic Radiology, 3,49-56.

Alexander D, **Krupinski E**, Wright W, Barrette T, McCreery T, Unger E. (1996). Evaluation of low-density gastrointestinal contrast agent : effect on computed tomography angiography. Academic Radiology, 3 (S2), 432-434.

\*Berbaum KS, Franken EA, Dorfman DD, Miller EM, **Krupinski EA**, Kreinberg K, Caldwell RT, Lu CH. (1996). The cause of satisfaction of search effects in contrast studies of the abdomen. Academic Radiology, 3,815-826.

\***Krupinski EA**. (1996). Visual scanning patterns of radiologists searching mammograms. Academic Radiology, 3,137-144.

\***Krupinski EA**. (1996). Clinical assessment of a dry-process laser system versus traditional wet film using CT, MRI and US. Academic Radiology, 3,855-858.

**Krupinski EA**. (1996). Influence of experience on scanning strategies in mammography. SPIE Medical Imaging, 2712,95-101.

**Krupinski EA**. (1996). Observer performance assessment of dry laser versus traditional wet film imaging systems. SPIE Medical Imaging , 2707,361-368.

\***Krupinski EA**, Weinstein RS, Rozek LS. (1996). Experience-related differences in diagnosing medical images displayed on monitors. Telemedicine Journal, 2,101-108.

\*Lund PJ, **Krupinski EA**, Brooks WJ. (1996). Ultrasound evaluation of sacroiliac motion in normal volunteers. Academic Radiology, 3,192-196.

Metzger-Rose C, Wright WH, Baker MR, **Krupinski EA**, McCreery TP, Barrette TR, Unger EC. (1996). Effect of phospholipid-coated microbubbles (MRX-115) on the detection of testicular ischemia in dogs. Academic Radiology, 3(S2), 315-316.

\*Dunn BE, Almagro UA, Choi H, Sheth NK, Arnold JS, Recla DL, **Krupinski EA**, Graham AR, Weinstein RS. (1997). Dynamic-robotic telepathology : Department of Veterans Affairs feasibility study. Human Pathology, 28, 8-12.

\*Halliday BE, Bhattacharyya AK, Graham AR, Davis JR, Leavitt SA, Nagle RB, McLaughlin WJ, Rivas RA, Martinez R, **Krupinski EA**, Weinstein RS. (1997). Diagnostic accuracy of an international telepathology consultation service. Human Pathology, 28, 17-21.

**Krupinski EA**, Hopper L. (1997). Teleradiology in rural Arizona: user's perspective. SPIE Medical Imaging, 3035, 350-354.

\***Krupinski EA**, Lund PJ. (1997). Differences in time to interpretation for evaluation of bone radiographs on monitors and film. Academic Radiology, 4, 177-182.

**Krupinski EA**, Lund PJ. (1997). Viewing time differences for film vs monitor viewing of radiographs - what eye-position reveals. SPIE Medical Imaging, 3036, 222-228.

**Krupinski EA**, Maloney K, Hopper L, Weinstein RS. (1997). Evaluation of radiologist performance using telemedicine services. J of Digital Imaging, 10,83-85.

\***Krupinski EA**, Nishikawa R M. (1997). Comparison of eye-position vs computer identified microcalcification clusters on mammograms. Medical Physics, 24, 17-23.

**Krupinski EA**, Ovitt T, Evanoff M. (1997). Use of image processing presets in chest radiography. J of Digital Imaging, 10,181-182.

\*Lund PJ, **Krupinski EA**, Pereles S, Mockbee B. (1997). Comparison of conventional and computed radiography: assessment of image quality and reader performance in skeletal extremity trauma. Academic Radiology, 4, 570-576.

\*Metzger-Rose C, **Krupinski EA**, Wright WH, Baker MR, McCreery TP, Barrette TR, Unger EC. (1997). Ultrasonic detection of testicular ischemia in a canine model using phospholipid coated microbubbles (MRX-115). J of Ultrasound in Medicine, 16, 317-324.

\*Roehrig H, **Krupinski EA**, Hulett R. (1997). Reduction of patient exposure in pediatric radiology. Academic Radiology, 4, 547-557.

**Krupinski EA**, Evanoff M. (1998). Effect of image processing on diagnostic decisions in chest radiography. Proc SPIE, 3340, 92-98.

\***Krupinski EA**, Evanoff M, Ovitt T, Standen JR, Chu TX, Johnson J. (1998). The influence of image processing on chest radiograph interpretation and decision changes. Academic Radiology, 5,79-85.

**Krupinski EA**, Kundel HL. (1998). An update on long-term goals for medical image perception research. Academic Radiology, 5, 629-633.

**Krupinski EA**, Kundel HL, Judy PF, Nodine CF. (1998). Medical Image Perception Society: key issues for image perception research. Radiology, 209:611-612.

\*+**Krupinski EA**, Nodine CF, Kundel HL. (1998). Enhancing recognition of lesions in radiographic images using perceptual feedback. Optical Engineering, 37, 813-818.

**Krupinski EA**, Roehrig H, Furukawa T, Tang C. (1998). Influence of monitor luminance and tone scale on observer detection performance. Proc SPIE, 3340, 99-104.

\*Nodine CF, **Krupinski EA**. (1998). Perceptual skill, radiology expertise and visual test performance with Nina and Waldo. Academic Radiology, 5, 603-612.

\*Pereles FS, Baker M, Baldwin R, **Krupinski E**, Unger EC. (1998). Accuracy of CT biopsy: laser guidance versus conventional freehand techniques. Academic Radiology, 5, 766-770.

Roehrig H, **Krupinski EA**. (1998). Image quality of CRT displays and the effect of brightness on diagnosis of mammograms. J of Digital Imaging, 11(S1),187-188.

Wright WH, McCreery TP, **KrupinskiEA**, Lund PJ, Smyth SH, Baker MR, Hulett RL, Unger EC. (1998). Evaluation of new thrombus-specific ultrasound contrast agent. Academic Radiology, 5S, 240-242.

\*Erly WK, Jacobson BE, Granstrom P, **Krupinski EA**, Lund PJ, McDaniel NT. (1999). Abdominal CT for trauma: an adequate screen for lower thoracic and lumbosacral fractures? [Emergency Radiology](#), 6, 294-298.

Johnson JP, Lubin J, **Krupinski EA**, Peterson HA, Roehrig H, Baysinger A. (1999). Visual discrimination model for digital mammography. [Proc SPIE Medical Imaging](#), 3663, 253-263.

**Krupinski EA**. (1999). Teleradiology satisfaction. [Advance for Administrators in Radiology & Radiation Oncology](#), 9, 50-52.

**Krupinski EA**. (1999). The radiologist and automated image analysis. [Proc SPIE New Approaches in Medical Image Analysis](#), 3747, 21-32.

**Krupinski EA**, LeSueur B, Ellsworth L, Levine N, Hansen R, Silvis N, et al. (1999). Diagnostic performance and image quality assessment in teledermatology. [Proc SPIE Medical Imaging](#), 3663, 199-206.

\***Krupinski EA**, LeSueur B, Ellsworth L, Levine N, et al. (1999). Diagnostic accuracy and image quality using a digital camera for teledermatology. [Telemedicine Journal](#), 5, 257-263.

**Krupinski EA**, McNeill K, Ovitt TW, Alden S, Holcomb M. (1999). Patterns of use and satisfaction with a university-based teleradiology system. [J Digital Imaging](#), 12, 166-167.

**Krupinski EA**, Roehrig H. (1999). Influence of monitor luminance and tone scale on observers' search and dwell patterns. [Proc SPIE Medical Imaging](#), 3663, 151-156.

\***Krupinski EA**, Roehrig H, Furukawa T. (1999). Influence of film and monitor display luminance on observer performance and visual search. [Acad Radiol](#), 6:411-418.

\***Krupinski EA**, Webster P, Dolliver M, Weinstein RS, Lopez AM. (1999). Efficiency analysis of a multi-specialty telemedicine service. [Telemedicine Journal](#), 5, 265-271.

Kundel HL, **Krupinski EA**. (1999). Soft-copy viewing calls for new way of thinking about images. [Diagnostic Imaging](#), Nov, 137-141.

\*Masaryk AM, Frayne R, Unal O, **Krupinski E**, Strother CM. (1999). In vitro and in vivo comparison of three MR measurement methods for calculating vascular shear stress in the internal carotid artery. [AJNR](#) 20, 237-245.

Roehrig H, **Krupinski EA**, Sivarudrappa M. (1999). Observer performance using CRT monitors with different phosphors. [Proc SPIE Medical Imaging](#), 3663, 217-224.

Shtern F, Winfield D, Behlen F, Blume H, Flynn MJ, Hemminger B, Huang HK, **Krupinski EA**, Kundel H, Roehrig H, Shile PE, Sickles E. (1999). Report of the working group on digital mammography: digital display and workstation design. [Acad Radiol](#), 6, S195-S219.

\*Spilde JM, Lee FT, Chosy SG, **Krupinski EA**, Kuhlman JE, Yandow DR. (1999). Evaluation of an experimental low-attenuation gastrointestinal contrast agent for CT imaging of intestinal ischemia in an animal model. [Academic Radiology](#) 6:94-101.

\*Berbaum KS, Franken EA, Dorfman DD, Caldwell RT, **Krupinski EA**. (2000). Role of faulty decision making in the satisfaction of search effect in chest radiography. [Acad Radiol](#), 7, 1098-1106.

\*Dixon T, Benjamin J, Lund P, Graham P, **Krupinski E**. (2000). Femoral neck buttressing: a radiographic and histologic analysis. [Skeletal Radiology](#), 29, 587-592.

\*Dunn BE, Choi H, Almagro UA, Recla DL, **Krupinski EA**, Weinstein RS. (2000). Routine surgical telepathology in the Department of Veterans Affairs: experience-related improvements in pathologist performance in 2200 cases. [Telemedicine Journal](#), 5, 323-338.

\*Hunter TB, **Krupinski EA**, Hunt KR, Erly WK. (2000). Emergency department coverage by academic departments of radiology. [Academic Radiology](#), 7, 165-170.

+\***Krupinski EA.** (2000). The importance of perception research in medical imaging. Radiation Medicine, 18, 329-334.

**Krupinski EA.** (2000). Evaluation of a low-cost digital camera for use in teleradiology applications. In: New Aspects of High Technology in Medicine. Bruch HP, Kockerling F, Bouchard R, Schug-Pass C (Eds). Monduzzi Editore, Italy, pp 499-503.

**Krupinski EA.** (2000). Three-years experience with a university-based telemedicine program. In: New Aspects of High Technology in Medicine. Bruch HP, Kockerling F, Bouchard R, Schug-Pass C (Eds). Monduzzi Editore, Italy, pp 493-497.

**Krupinski EA.** (2000). Medical image perception: evaluating the role of experience. Proc SPIE Human Vision & Electronic Imaging, 3959, 281-289.

**Krupinski EA**, Berger W, Erly W. (2000). Evaluation of head CT exams - resident and attending diagnoses. SPIE Medical Imaging, 3981, 164-169.

**Krupinski EA**, Gonzales M, Gonzales C, Weinstein RS. (2000). Evaluation of a digital camera for acquiring radiographic images for telemedicine applications. Telemedicine Journal and e-Health, 6, 297-302.

\*+**Krupinski EA**, Roehrig H. (2000). Recent developments in evaluating soft-copy displays for medical images. Recent Research Developments in Optical Engineering, 3, 35-49.

\***Krupinski EA**, Roehrig H. (2000). The influence of a perceptually linearized display on observer performance and visual search. Academic Radiology, 7, 8-13.

**Krupinski EA**, Roehrig H, Schempp W. (2000). Physical and psychophysical evaluation of a new digital specimen radiography system for use in mammography. SPIE Medical Imaging, 3981, 208-215.

\*Unger E, Metzger P, **Krupinski E**, Baker M, Hulett R, Gabaeff D, Mills J, Ihnat D, McCreery T. (2000). The use of a thrombus-specific ultrasound agent to detect thrombus in arteriovenous fistulae. Investigative Radiology 35, 86-89.

\*Barker G, **Krupinski EA**, Laursen T, Erps K, Weinstein RS. (2001). Pay per view: the Arizona Telemedicine Program's billing results. Telemedicine J & e-Health, 7, 287-291.

\*Berbaum KS, Brandser EA, Franken EA, Dorfman DD, Caldwell RT, **Krupinski EA**. (2001). Gaze dwell times on acute trauma injuries missed because of satisfaction of search. Acad Radiol, 8, 304-314.

\*Berger WG, Erly WK, **Krupinski EA**, Standen JR, Stern RG. (2001). The solitary pulmonary nodule on chest radiography: can we really tell if the nodule is calcified? American Journal of Roentgenology, 176, 201-204.

\*Hunter TB, **Krupinski EA**, Hunt KR, Erly W. (2001). Academic radiology and doctor discontent: the good news and the bad news. Academic Radiology, 8, 509-511.

+\***Krupinski EA.** (2001). The possibility of low-cost telemedicine. Business Briefing: Next Generation Healthcare, CD-ROM Edition, 1-4.

\***Krupinski EA.** (2001). Softcopy interpretation. eMedicine Journal, January 2001, V 2, No 1, <http://www.emedicine.com/radio/topic872.htm>.

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\***Krupinski EA**, Radvany M, Levy A, Ballenger D, Tucker J, Chacko A, VanMetter R. (2001). Enhanced Visualization Processing: effect on workflow. Academic Radiology, 8:1127-1133.

**Krupinski EA**, Radvany M, Levy A, Ballenger D, Tucker J, Chacko A, VanMetter R. (2001). Influence of enhanced visualization processing (EVP) of chest images on workflow. Proc SPIE Medical Imaging, 4324, 77-81.

**Krupinski EA**, Roehrig H. (2001). Observer performance using monitors with different phosphors – an ROC study. Proc SPIE Medical Imaging, 4324, 18-22.

\*Ozgur H, Walsh K, Masaryk A, Seeger JF, Williams W, **Krupinski EA**, Melgar M, Labadie E. (2001). Correlation of cerebrovascular reserve as measured by acetazolamide-challenged SPECT with angiographic flow patterns and intra- or extracranial arterial stenosis. Am J Neuroradiology, 22, 928-936.

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\*Roehrig H, **Krupinski EA**, Furukawa T. (2001). Evaluation of a flat CRT monitor for use in radiology. Journal of Digital Imaging, 14:142-148.

Roehrig H, **Krupinski EA**, Furukawa T. (2001). Physical and psychophysical evaluation of a flat CRT monitor. Proc SPIE Medical Imaging, 4324, 35-44.

\*Weinstein RS, Descour MR, Liang C, Bhattacharyya AK, Graham AR, Davis JR, Scott KM, Richter L, **Krupinski EA**, Szymbus J, Kayser K, Dunn BE. (2001). Telepathology overview: from concept to implementation. Human Pathology, 32:1283-1299.

\*Altbach MI, Outwater EK, Trouard TP, **Krupinski EA**, Theilmann RJ, Stopeck AT, Kono M, Gmitro AF. (2002). Radial fast spin-echo method for T2-weighted imaging and T2 mapping of the liver. J Magnet Reson Img, 16, 179-189.

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Johnson JP, **Krupinski EA**, Nafzinger J, Lubin J, Wus J, Roehrig H. (2002). Perceptually optimized compression of mammograms. Proc SPIE Medical Imaging, 4686, 256-262.

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**Krupinski EA**, Johnson J, Roehrig H, Lubin J. (2002). Optimizing softcopy mammography displays using a human visual system model: influence of display phosphor. Proc SPIE Medical Imaging, 4686, 331-337.

\*+**Krupinski EA**, Nypaver M, Poropatich R, Ellis D, Safwat R, Sapci H. (2002). Clinical applications in telemedicine/telehealth. Telemedicine J & e-Health, 8, 13-34.

**Krupinski EA**, Ovitt T. (2002). Relationship of image quality to decision accuracy for ARVD in MRI. Proc SPIE Medical Imaging, 4686, 100-106.

\***Krupinski EA**, Roehrig H. (2002). Pulmonary nodule detection and visual search: P45 and P104 monochrome versus color monitor displays. Acad Radiol, 9:638-645.

\*Pereles FS, McCarthy RM, Baskaran V, Carr JC, Kapoor V, **Krupinski EA**, Finn JP. (2002). Thoracic aortic dissection and aneurysm: evaluation with nonenhanced true FISP MR angiography in less than 4 minutes. Radiol, 223, 270-274.

Roehrig H, Dallas WJ, Blume H, **Krupinski EA**, Rogulski MM, Fan J, Gandhi K. (2002). Evaluation of plain-film digitizers: a comparison of different systems and models. Proc SPIE Medical Imaging, 4682, 694-703.

\*Baskaran V, Pereles FS, Georganos SA, Shaibani A, Spero KA, **Krupinski EA**, Zhang A, Finn JP. (2003). Myelographic MR imaging of the cervical spine with a 3D true fast imaging with steady-state precision technique: initial experience. Radiology 2003;227:585-592.

Johnson JP, Nafziger J, Krupinski EA, Lubin J, Roehrig. (2003). Effects of grayscale window/level parameters on breast lesion detectability. Proc SPIE Medical Imaging, 5034, 462-473.

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\***Krupinski EA.** (2000). The importance of perception research in medical imaging. Nippon Medical Image Perception Society 2<sup>nd</sup> Annual Meeting, Jan 28, Matsuyama, Japan.

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\***Krupinski EA.** (2000). Workstation evaluation research at the University of Arizona. Toshiba Corporation Engineers Meeting, Jan 31, Tokyo, Japan.

**Krupinski EA.** (2000). Choosing the right monitor and interface for viewing medical images. 6<sup>th</sup> Internet World Congress for Biomedical Sciences, Feb 14-25.

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\***Krupinski EA**. (2002). Teleradiology short-course. 7<sup>th</sup> Annual American Telemedicine Association, 2-5 June, Los Angeles, CA.

\***Krupinski EA**. (2002). Building successful telemedicine programs workshop: Telemedicine assessment – does it work? 7<sup>th</sup> Annual American Telemedicine Association, 2-5 June, Los Angeles, CA.

\***Krupinski EA**. (2002). Image perception issues in a soft-copy reading environment workshop: Parameters affecting perception of images on soft-copy displays. SCAR, 2-5 May, Cleveland, OH.

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Taljanovic MS, Hunter TB, Fitzpatrick KA, **Krupinski EA**. (2002). Importance of standard radiography in evaluation of musculoskeletal magnetic resonance imaging. American Roentgen Ray Society, 28 Apr – 3 May, Atlanta, GA.

Weinstein RS, **Krupinski EA**. (2002). Arizona Telemedicine Program. 7<sup>th</sup> American Telemedicine Association Meeting, 2-5 June, Los Angeles, CA.

Barker G, Kerr RA, **Krupinski EA**, Weinstein RS. (2003). A study of the rural health care division program. 8<sup>th</sup> American Telemedicine Association Meeting, 27-30 April, Orlando, FL.

Barker G, Kerr RA, McNeill K, **Krupinski E**, Weinstein RS. (2003). Travel trends in the Arizona Telemedicine Program. 8<sup>th</sup> American Telemedicine Association Meeting, 27-30 April, Orlando, FL.

Fan J, Dallas WJ, Roehrig H, **Krupinski EA**. (2003). Improving visualization of digital mammograms on the CRT display system. SPIE Medical Imaging, 15-20 Feb, San Diego, CA.

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Kahn S, Taljanovic M, Erly WK, Fitzpatrick KA, Hunter TB, **Krupinski E**. (2003). Rationale for simultaneous magnetic resonance imaging of pelvis and lumbar spine in patients with hip and low back pain. 103<sup>rd</sup> Annual Mtg Am Roentgen Ray Society, 4-9 May, San Diego, CA.

**Krupinski EA**. (2003). Preparing slides & posters: some perceptual tips for better presentation – a short tutorial. SPIE Medical Imaging, 15-20 Feb, San Diego, CA.

**Krupinski EA**. (2003). Telemedicine assessment – does it work? 8<sup>th</sup> American Telemedicine Association Meeting, 27-30 April, Orlando, FL.

**Krupinski EA**, Barker G, Engstrom M, Levine N, Weinstein R. (2003). Challenges in assessing outcomes in teledermatology. 8<sup>th</sup> American Telemedicine Association Meeting, 27-30 April, Orlando, FL.

**Krupinski EA**, Barker, Levine N, Weinstein R. (2003). Patterns of teledermatology referrals over a 3-year period. 8<sup>th</sup> American Telemedicine Association Meeting, 27-30 April, Orlando, FL.

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**Krupinski EA**, McNeill K, Haber K, Ovitt T. (2003). Radiologist satisfaction in a high volume teleradiology service. 8<sup>th</sup> American Telemedicine Association Meeting, 27-30 April, Orlando, FL.

**Krupinski EA**, McNeill K, Haber K, Ovitt T. (2003). High volume teleradiology service: focus on radiologist satisfaction. SCAR 2003 Annual Meeting, 7-10 June, Boston, MA.

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Roehrig H, **Krupinski EA**, Chawla AS, Fan JH, Gandhi K. (2003). Spatial noise and threshold contrasts in LCD displays. SPIE Medical Imaging, 15-20 Feb, San Diego, CA.

Roehrig H, **Krupinski E**, Fan JH, Gandhi K, Chawla A. (2003). Noise of LCD display systems. 17<sup>th</sup> international Congress Computer Assisted Radiology & Surgery, 25-28 June, London, England.

Steinway ML, Taljanovic MS, Hunter TB, **Krupinski EA**, Grana WA. (2003). Rings and things on upper extremity radiographs of emergency patients. Clinical Research Health Services Research, 14 March, Baltimore, MD.

## **CONFERENCE COMMITTEE MEMBER**

**SPIE Medical Imaging 1994: Image Perception**. Program Committee. 17-18 Feb, 1994, Newport Beach, CA.

**SPIE Medical Imaging 1995: Image Perception**. Program Committee. 26 Feb - 2 March, 1995, San Diego, CA.

**Sixth Far West Image Perception Conference**. Program Committee. 13-15 Oct, 1995, Philadelphia, PA.

**SPIE Medical Imaging 1996: Image Perception**. Program Committee. 10-15 Feb, 1996, Newport Beach, CA.

**SPIE Medical Imaging 1997: Image Perception**. Program Committee. 22-28 Feb, 1997, Newport Beach, CA.

**Seventh Far West Image Perception Conference**. Conference Host/Organizer. 16-18 Oct, 1997, Tucson, AZ.

**SPIE Medical Imaging 1998: Image Perception**. Program Committee. 21-26 Feb, 1997, San Diego, CA.

**Eighth Far West Image Perception Conference**. Program Committee. 27-30 May, 1999, Alberta, Canada.

**SPIE Medical Imaging 1999: Image Perception**. Conference Chair. 20-26 Feb 1999, San Diego, CA.

**Arizona Corrections Telemedicine Conference**. Program Staff. 21-23 Nov, 1999, Phoenix, AZ.

**SPIE Medical Imaging 2000: Image Perception** Conference Chair. 12-18 Feb 2000, San Diego, CA.

**Arizona Corrections Telemedicine Conference**. Program Staff. 19-21 Nov, 2000, Tucson, AZ.

**SPIE Medical Imaging 2001: Image Perception** Conference Chair. 17-22 Feb 2001. San Diego, CA.

**Medical Image Perception Society Conference IX** Program Committee. 20-23 Sep 2001. Warrenton, VA.

**Arizona Corrections Telemedicine Conference**. Program Staff. 18-20 Nov, 2001, Tucson, AZ.

**SPIE Medical Imaging 2002: Image Perception** Conference Chair. 23-28 Feb 2002. San Diego, CA.

**American Telemedicine Association Annual Meeting** Program Committee. 2-5 June 2002. Los Angeles, CA.

**Arizona Corrections Telemedicine Conference.** Program Staff. 24-26 Nov, 2002, Phoenix, AZ.

**SPIE Medical Imaging 2003: Image Perception** Conference Chair. 15-20 Feb 2003. San Diego, CA.

**American Telemedicine Association Annual Meeting** Program Committee. 27-30 April 2003. Orlando, FL.

**Medical Image Perception Society Conference X** Program Committee. 11-14 Sep 2003. Durham, NC

**DISSERTATION/THESIS COMMITTEE MEMBER & STUDENT PROJECT ADVISOR**

..... (1993). Real-time distributed database using file management and remote conferencing for Global PACS. Master's Thesis Dept. of Electrical and Computer Engineering, University of Arizona.

..... (1993). JPEG Compression and communications in a telepathology system. Master's Thesis Dept. of Electrical and Computer Engineering, University of Arizona.

..... (1994). Predicting human performance by model observers. Doctoral Dissertation Optical Sciences Dept., University of Arizona.

..... (1994-1995). Observer performance detection of objects in IR images. Undergraduate Level Independent Study, Department Electrical Engineering, University of Arizona.

..... (1995). Observer performance using medical images varying in lumpiness and counts. Graduate Level Independent Study, Department of Psychology, University of Arizona.

.....(1995-1996). Observer performance detection of blurred targets in IR images. Undergraduate Level Independent Study, Department Electrical Engineering, University of Arizona.

..... (1996 - 1998). Decision strategies in radiology. Doctoral Dissertation Library Sciences Department, University of Arizona.

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..... (1997). Influence of symmetry and depth on scanning patterns while viewing artworks. Undergraduate Level Honors Independent Study, Department of Psychology, University of Arizona.

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### **GRANTS AWARDED**

- Design of an image database for radiology research: impact of image recall.  
.....). Elizabeth A. Krupinski, PhD, PI. .... April 1993 - April 1994.
- Demonstration of movement in the sacroiliac joint using fluoroscopic imaging techniques. .... Elizabeth A. Krupinski, PhD, Co-PIs. Wallace Genetics Foundation; .....; February 1, 1994 - July 31, 1994.
- Computer-aided visual search: improving the early detection of cancer in mammograms.  
..... Elizabeth A. Krupinski, PhD, PI. .... April 1994 - April 1995.
- Evaluation of 3M dry film processor. .... Elizabeth A. Krupinski, PhD, PI. .... March 1995 - August 1995.
- Evaluation of ROC Assistant program for running and analyzing ROC studies. ....  
Elizabeth A. Krupinski, Ph.D., ....; August 1995 - December 1995.
- Improving computer aided detection of cancer in mammograms. ....  
Elizabeth A. Krupinski, PhD, PI. .... July 1, 1995 - June 30, 1996.
- Digital breast specimen radiography for improved biopsy. .... & Elizabeth Krupinski, PhD Co-PIs. .... June 1, 1996 - May 31, 1998.

- Clinical and technical performance evaluation of a digital mammography system.  
..... & Elizabeth Krupinski, PhD, Co-PIs. .... July 1, 1996 - June 30, 1999.
- ..... Foreign Travel Grant: Fall 1994; Spring 1996; Fall 1998; Spring 1999
- Seventh Far West Image Perception Conference Grant. NIH. Elizabeth Krupinski, PhD, PI. \$13,831. March 1, 1997 - February 28, 1998.
- Interactive three-dimensional display for evaluation of coronary artery disease.  
..... & Elizabeth Krupinski, PhD, Co-PIs. .... July 1, 1995 - June 30, 1998.
- Arizona Telemedicine Program with Ganado, Nogales, Springerville. ...., Elizabeth Krupinski Program Evaluator. .... October 1, 1997 - September 30, 1998.
- Evaluation of Flat-Panel LCD Monitor. .... & Elizabeth Krupinski, co-PIs. .... Feb 20, 1999 - Dec 10, 1999.
- Far West Image Perception Conference IX. FDA. Elizabeth Krupinski, PhD PI. \$7500. June 1, 2000 - May 31, 2001.
- Improving CRT display of digital mammograms. NIH 1R01 CA85626. Hans Roehrig, PhD & Elizabeth Krupinski, PhD co-PIs. \$884,004. 04/01/00 – 03/31/03.
- Soft copy display for digital mammography. NIH R01 CA79930. Hans Roehrig, PhD & Elizabeth Krupinski, PhD co-PIs. \$741,241. 12/01/00 – 11/30/03.
- Optimizing softcopy displays for digital mammography. NIH R01 CA87816. Elizabeth Krupinski, PhD PI. \$1,678,100.8/01/00 – 7/31/04.
- Vision-model-based Image Enhancement for Digital Mammography.  
.....). Elizabeth Krupinski, PhD PI to sub-contract. ....(sub-contract award). 01/01/02 – 30/09/02.
- Breast CT Scanner for Early Cancer Detection. NIH. John Boone, PhD PI (UC Davis). Elizabeth Krupinski, PhD – statistical consultant sub-contract. \$6,082,284. 11/01/02 – 10/30/05.
- MRI-Guided Angioplasty of Coronary Artery Stenosis. NIH Debiao Li, PhD (Northwestern Univ). Elizabeth Krupinski, PhD – statistical consultant. \$12,500 sub-contract. 4/1/03 – 2/29/08.